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CLAIMS

What is claimed is:

1. A phased array antenna, comprising:

a first dielectric filled waveguide structure for dividing an input of electromagnetic (EM) wave energy into a first plurality of EM wave signals;

a second dielectric filled waveguide structure disposed adjacent said first dielectric filled waveguide structure having a plurality of dielectric filled waveguides for receiving each of said first plurality of EM wave signals and channeling said first plurality of EM wave signals toward an output end of each one of said plurality of dielectric filled waveguides; and

a stripline waveguide circuit board positioned adjacent said second dielectric filled waveguide structure and having circuit traces forming a plurality of inputs overlaying said output ends of said dielectric filled waveguides, said stripline waveguide circuit board distributing said EM wave signals via said circuit traces to a plurality of closely spaced EM wave radiating elements.

2. The phased array antenna of claim 1, wherein said first dielectric waveguide structure forms a 1X4 dielectric filled waveguide structure.

3. The phased array antenna of claim 1, wherein said second dielectric filled waveguide structure comprises a plurality of generally circular dielectric filled waveguides.

4. The phased array antenna of claim 1, wherein said stripline waveguide circuit board comprises a plurality of binary signal splitters for equally distributing EM wave energy from said EM wave signals to each of said EM wave radiating elements.

5. A phased array antenna, comprising:

a first dielectric filled waveguide structure for dividing an input of electromagnetic (EM) wave energy into a first plurality of EM wave signals;

a second dielectric filled waveguide structure having a plurality of dielectric filled, generally circular waveguides for receiving each of said first plurality of EM wave signals at inputs ends thereof and channeling said first plurality of EM wave signals toward output ends of said plurality of dielectric filled waveguides; and

a stripline waveguide distribution circuit disposed generally parallel to and adjacent said second dielectric filled waveguide structure for receiving said EM wave signals and further dividing and further distributing EM wave energy therefrom to a plurality of EM wave radiating elements.

6. The phased array antenna of claim 5, wherein said stripline waveguide distribution circuit comprises a plurality of signal traces forming signal paths, with a plurality of input traces of said signal traces communicating with said generally circular waveguides to receive and channel said EM wave signals into said stripline waveguide distribution circuit.

7. The phased array antenna of claim 5, wherein said first dielectric filled waveguide structure forms a 1X4 corporate waveguide structure.

8. The phased array antenna of claim 5, wherein said stripline waveguide distribution circuit comprises a plurality of binary signal splitters for dividing said EM wave signals as said EM wave signals are routed through said stripline waveguide distribution circuit.

9. The phased array antenna of claim 5, wherein said first dielectric filled waveguide structure comprises an air filled rectangular waveguide.

10. A millimeter wave phased array antenna comprising:

a corporate waveguide feed for evenly dividing an input electromagnetic (EM) wave signal to a sub-plurality of EM wave signals;

a dielectric filled waveguide structure forming a plurality of generally circular, dielectric filled waveguides for receiving said sub-plurality of EM wave signals and channeling said sub-plurality of EM wave signals to output ends of said dielectric filled waveguides; and

a stripline waveguide structure overlaying said dielectric filled waveguide structure for further dividing and distributing EM wave energy from said EM wave signals to a plurality of radiating elements.

11. The antenna of claim 10, wherein said corporate waveguide structure comprises a 1X4, air filled corporate waveguide feed.

12. The antenna of claim 10, wherein said stripline waveguide structure includes a plurality of input traces each electrically coupled with an associated one of said generally circular dielectric filled waveguides.

13. The antenna of claim 10, wherein said stripline waveguide structure comprises a plurality of binary signal splitters for dividing said EM wave signals prior to applying said EM wave signals to said radiating elements.

14. A method for forming a phased array antenna, comprising:

using a corporate waveguide feed for evenly dividing an input electromagnetic (EM) wave signal to a plurality of EM wave signals;

channeling said sub-plurality of EM wave signals through a plurality of dielectric filled waveguides; and

using a stripline waveguide in communication with said dielectric filled waveguides for further dividing and distributing said EM wave energy to a plurality of radiating elements.

15. The method of claim 14, wherein using a corporate waveguide comprises using a 1X4 corporate waveguide for evenly dividing said EM wave signal into a plurality of four EM wave signals.

16. The method of claim 14, wherein using a stripline waveguide comprises using a plurality of binary signal splitters to further evenly divide said sub-plurality of EM wave signals to a plurality of antenna radiating elements.

14 17. A method of using a phased array antenna, comprising:

generating an electromagnetic (EM) wave input signal;

directing said EM wave input signal into an input of a corporate waveguide wherein said EM wave input signal is divided into a first sub-plurality of EM wave signals;

channeling said first sub-plurality of EM wave signals into a dielectric filled waveguide structure having a corresponding plurality of dielectric filled waveguides;

coupling said first sub-plurality of EM wave signals into a stripline waveguide structure wherein said EM wave energy of said first sub-plurality of EM wave signals is further successively divided into a second sub-plurality of EM wave signals; and

applying said second sub-plurality of EM wave signals to a corresponding plurality of antenna elements.

16 18. The method of claim 17, wherein coupling said first sub-plurality of EM wave signals into a dielectric filled waveguide structure further comprises using a plurality of binary signal splitters to successively divide said first sub-plurality of EM wave signals.

15 19. The method of claim 17, wherein using said corporate waveguide comprises using a 1X4 corporate waveguide.

20. The method of claim 17, wherein channeling said first sub-plurality of EM wave signals into a dielectric filled waveguide structure comprises channeling said first sub-plurality of EM wave signals in generally circular, dielectric filled waveguides.

21. A method of forming a phased array antenna for use with a MILSTAR communications protocol at millimeter wave frequencies without the need to know future beam hopping frequencies used in the implementation of said MILSTAR communications protocol, the method comprising:

generating an electromagnetic (EM) wave input signal;

routing said EM wave input signal through an air filled corporate waveguide so that the EM wave input signal is divided into a first sub-plurality of EM wave signals;

coupling said first sub-plurality of EM wave signals into a stripline waveguide structure disposed generally parallel relative to said air filled corporate waveguide, and including a plurality of EM wave radiating elements, wherein said EM wave energy is further successively divided into a second sub-plurality of EM wave signals; and

using said stripline waveguide structure to route said second sub-plurality of EM wave signals to said EM wave radiating elements.